Application No. 09/599,963
November 9, 2004
Reply to office action of August 9, 2004

Remarks/Arguments

Applicant gratefully acknowledges the thorough Examination to date and has made an effort to fully respond to all the issues raised by the Examiner. Applicant has taken care and believes that no new matter has been introduced by way of this amendment. Reconsideration of the application in view of the above amendments and following remarks is respectfully requested.

Rejection of Claims 1 through 12, and 22 under 35 USC 102

The Examiner has objected to Claims 1 through 22, and 22, under 35 USC 102(b) as being anticipated by the U.S. Patent Number 5,563,875, issued to Hefel et al.

Examiner states:

"Re Claims 1, 7, fig, 4 teaches a Node A (common node) sending signals to Node B & C (first and second) to measure the round trip delays to compute the transmit time (See Abstract & col. 5, lines 46+).

Re Claims 2, 9, refer to Claim 1, Node A is directed connected to NodeB.

Re Claims 3, 10, refer to Claim 1, Node C is indirectly connected to Node A.

Re Claims 4, refer to Claim 1, wherein Node A is Network management computer.

Re Claims 5, 8, 11, refer Claim 1, fig. 4 is a hierarchical network and is a portion of the mesh network, i.e., SNA (See col. 1, line 60) wherein the subnetworks are form between the nodes, i.e. Node A to Node B & Node A to Node C.

Re Claim 6, refer to Claim 1, wherein adding the transmit time gives the total transmit time of the complete path between the source and destination.

Re Claim 12, refer to Claim 6, wherein the interim transit delay is formed between Node A – Node B subnetwork (adjacent nodes).

Re Claim 22, refer to Claim 1, wherein the total transmit time is the total jitter. "

Applicant respectfully disagrees with the rejection based on the Hefel et al. patent. Applicant respectfully submits that the Hefel al. patent is primarily concerned with testing networks to identify bottlenecks in the network. More particularly, the Hefel et al. patent discloses a method of calculating link delays between nodes in a data network by sending wrap-around route testing messages along a "pre-calculated route". Hefel et al. further discloses that this pre-calculated route must be determined prior to sending the wrap-around route testing messages. The determination of the pre-calculated route ensures that the plurality of wrap-around route testing messages are sent to each node along the pre-calculated route. The present

invention does not require such knowledge to send signals along the communication path. Rather, the present invention assumes that a path between the start node and the end node is available. According to the present invention, there may be several communication paths available between a start node and an end node, as shown in Figure 3 of the subject application. For example, if node 's' is selected as the destination node then the signal path could follow 'k', 'a', 'b', 'c', 'd', and 'r', or alternatively 'k', 'a', 'q', and 'r' to 's'. The present invention does not require pre-calculating that path prior to sending signals to each of the nodes along that path. Thus, the present invention is clearly distinguished over the prior art as it is a simplification over the method of the prior art.

In addition to this distinction over the prior art, Applicant has amended the Claims to more clearly define the novel and inventive subject matter of the present invention. The present invention teaches (as discussed on page 11 of the specification as originally filed) that the transit delay calculated for the communication path is then used to calculate a data processing overhead time for each node in that path. Furthermore, the data processing overhead time may appreciate or depreciate based on the processing delays of the nodes along that path. The processing overhead time of a path between adjacent nodes is calculated as the difference between the current transit delay and the minimum transit delay for the path between adjacent nodes.

Claim 1 has been amended to include this calculation as the processing overhead time is advantageous for systems managing network performance. The Examiner's attention is drawn to a further limitation in Claim 1:

> "a8) subtracting a previously determined minimum transit delay between the first node and the second node with the transit delay between the first node and the second node."

The Hefel et al. patent is narrowly focussed on testing communication paths in a network rather than monitoring network performance of nodes in a network as provided in the present invention. Accordingly, Claim 1 as amended is novel and inventive over the teachings of the Hefel et al. patent. Furthermore, the dependent Claims 2 through 5 are also deemed patentable as they depend from novel subject matter in base Claim 1. Thus, Applicant respectfully submits that the objection to Claims 1 through 5 has been overcome.

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With respect to providing support for the novel subject matter in the claims, the amendments made to the Claims are supported by the original disclosure. In addition, the amendments made to the Specification to more clearly define the invention can be inferred from the text as originally filed as follows:

"In cases where the processing time at a node is appreciable, it is assumed that this time is a constant and is adjusted for in delay calculations concerning that node. We outline below one way of determining this processing overhead time:

Consider two adjacent nodes A1 and B1 which are connected such that the path to B1 from the NMC, K1, goes through A1 as in Figure 1. Let R(K1, B1) and R(K1, A1) be the round trip delays to nodes B1 and A1 from K1 respectively. If, at any given time, R(K1, B1) is less than the minimum ever recorded value of R(k1, A1) then this discrepancy is attributed to the processing overhead time at node A1 and hence we deduce the processing time of A1, P(A1), as

P(A1) = R(K1,B1) - minimum(R(K1,A1))This processing time is then subtracted from all delay calculations involving node A1. For example:

R(K1,A1) = R(K1,A1) - P(A1)".

Based on the above text, Applicant amended the Specification to more clearly define the present invention as follows:

"The round trip delay of the signal sent from the common node to adjacent nodes is a portion of the time taken at the nodes to respond to the query. The time taken by adjacent nodes may include the time the data waits in the queue of a device at the node before being transmitted and the time to process the data at the other end after being received. Thus, the total time taken for adjacent nodes to respond to the query is referred to as the processing overhead time."

Applicant further highlights the patentable distinction of the present invention over the prior art reference by further amending the Specification as follows:

"Referring again to Figure 3, there may be multiple paths available for signal routing between a start node and an end node. As one object of the present invention is to determine the processing overhead time for a given communication path, present invention can circumvent any ambiguities in the topology of the network prior to querying the nodes along the communication path. Alternatively put, multiple queries, or pings, are sent from the common node to the first node, from the common node to the second node and so on and so forth to the end node, prior to determining the specific topology of that communication path. The communication path is taken into account after the queries are sent. The method of the present invention differs significantly from the prior art, as disclosed in U.S.P.N. 5,563,875 wherein pre-calculated routes are required to send "wrap-around" test messages to each node in the pre-calculated route."

In view of the preceding remarks, Applicant believes that the amendments should serve to highlight and more clearly define the claimed present invention as novel over the cited prior art as there is no disclosure in the prior art relating to the determination of the processing overhead time. Applicant also confirms that no new matter has been added by way of the amendment discussed above.

With respect to the rejection of Claim 22, Applicant has amended the claim to more clearly define the invention as follows:

> "A method of determining a total jitter between a start node and an end node in a network, the method comprising:
> a) determining interim jitters in transit delays between adjacent nodes based on a communications path between the start node and the end node;
> b) calculating the total jitter based on transit delays between the start node and the end node by adding up the interim jitters."

The Hefel et al. patent does not discuss the calculation of jitter in its disclosure. The Applicant respectfully submits that the rejection of Claim 22 is unfounded and perhaps based on a misread of the claim. Applicant does not provide "the total transit time is the total jitter", as stated by the Examiner but rather, as emphasized in the claim, the jitter is an additional calculation based on a previous calculation. Thus, Applicant believes that Claim 22 as amended is allowable.

Finally, in respect of Claims 6 through 12, Applicant has deleted these Claims. As such, the rejection under 35 USC 102 has been overcome by the remarks and amendments made above.

Rejection of Claims 13 through 21 under 35 USC 103

The Examiner has objected to Claims 13 through 21 under 35 USC 103(a) as being unpatentable over U.S. Patent Number 5,563,875, issued to Hefel et al., in view of U.S. Patent Number 5,563,875, issued to Grohn et al., and further in view of U.S. Patent Number 4,569,042, issued to Larson.

The Examiner states:

> "Re Claims 13, 19, refer to Claim 1, Hefel teaches measuring the transit time between to nodes A & B (measuring a transmit delay) wherein plurality of link transit

times can be analyzed to localize congestion or identify failed resources (See abstract). Hefel fails to explicitly teach that the transmit delays are measured at different times. However, Grohn teaches that repeated round-trip measurement are performed because the the round-trip delay over the communications network can change over time, hence repeatedly measuring the transit time would have reflected the condition of the network (See col. 5, lines 10-15). Therefore, one skilled in the art would have been motivated to measure the transit delay at different times to adaptive to the current condition of the network. Hefel also fails to explicitly teach calculating a jitter among the plurality of time delay measurements and determining if the jitter exceeds a predetermined threshold value. However, Larson teaches a difference calculator 204 and the delay calculator wherein the value of the estimated one-way delay computed by the delay clalculator 205 is compared with a value of a predetermined maximum acceptable one-way delay (See col. 7, lines 34-68). One skilled in the art would have been motivated by Larson to compare the jitter with the predetermined threshold value to determine whether the route is acceptable or reliability. Therefore, it would have been obvious to one ordinary skilled to combine the teaching of Grohn and Hefel into the teaching of Hefel."

Applicant respectfully disagrees with the rejection under 35 USC 103 in that the Hefel et al. patent does not teach the calculation of jitter and neither do the two other cited prior art. The Larson patent teaches a difference calculator 204 and a delay calculator 205. Applicant respectfully submits that the Examiner has confused these features with means for calculating jitter. Applicant teaches at page 1 of the Specification that "jitter...measures the variance of the delay". The teaching of a "delay calculator 205 ...compared with a value of a predetermined maximum acceptable one-way delay" does not constitute the calculation of jitter. Finally, Grohn et al. does not teach nor fairly suggest the jitter calculation. Accordingly, Applicant respectfully submits that Claims 13 through 21 relating to the calculation of jitter are patentable over that the Hefel et al. patent, the Grohn et al. patent, and the Larson patent, either taken alone or in any combination.

Applicant respectfully submits that all of the Claims presently standing in the application are patentably distinguished from the teachings of all references of record either taken alone or in any combination.

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Allowable Subject Matter

The Examiner has allowed Claims 23 through 26 as the prior art fails to teach the step of calculating the jitter based on J(A,B) formula. Applicant is in agreement with the statement of reasons.

Conclusion

Applicant respectfully submits that the outstanding rejections under 35 USC 102 and 103 have been overcome by the above amendment. Applicants have made an effort to substantially eliminate any unclear details within the claims and believe that no new matter has been entered during this process. Applicant respectfully submits that all of the claims presently standing in the application are patentably distinguished from the teachings of all references of record either taken alone or in any combination. Accordingly, reconsideration and allowance of this application is respectfully solicited.

Should any further fees or payments be necessary for entry of this amendment and further prosecution of this application, the undersigned hereby authorizes the Commissioner to debit and/or credit our Deposit Account No. 16-0600.

Respectfully submitted

November 8, 2004
Date

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